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III. REJECTIONS OF CLAIMS 15 AND 16 UNDER 35 U.S.C. §102

Claims 15 and 16 stand rejected under 35 U.S.C. §102 as being anticipated by RMII Consortium on March 20, 1998 per RMII Specification, Rev. 1.2 (the “RMII”). The rejection is respectfully traversed for at least the following reasons.

One of the features recited in claims 15 and 16 is use of a time-division multiplexed receive control line and a time-division multiplexed transmit control line. On the other hand, the RMII relates to a system using separate control lines which are not time-division multiplexed. Similar to the present invention, the system described in the RMII is capable of interfacing the MAC with the PHY. However, unlike the present invention, the RMII system does not utilize a time-division multiplexed control line.

CLAIM 15

The Examiner states that RX_DV in Fig. 1 and paragraph 6.0 “Frame Structure” in the RMII shows a time-division multiplexed receive control line. However, this is not true. First, RX_DV in Fig. 1 is a single control line which is not time-division multiplexed. Fig. 1 of the RMII does not indicate that RX_DV is a time-division multiplexed control line. Second, paragraph 6.0 and corresponding Fig. 5 in the RMII merely shows how an MAC’s serial bit stream of data is divided into two di-bit streams sent through RXD[1:0] (Receive Data [1:0]) and TXD[1:0] (Transmit Data [1:0]). See, for example, paragraphs 5.3, 5.5, and 6.0 of the RMII. In other words, paragraph 6.0 relates to data lines, not control lines. Thus, paragraph 6.0 of the RMII does not disclose use of a time-division multiplexed control line either.

The Examiner asserts that TX_EN in Fig. 1 and paragraph 6.0 shows a time-division multiplexed transmit control line. However, this is also not true. TX_EN in Fig. 1 is a control line which is not time-division multiplexed. Fig. 1 simply does not illustrate any kind of time-division multiplexing technique. Paragraph 6.0 of the RMII does not disclose time-division multiplexing, either.

For at least these reasons, the RMII fails to disclose the time-division multiplexed receive and transmit control lines recited in claim 15. Therefore, it is respectfully submitted that the present invention of claim 15 is not anticipated by the RMII. Withdrawal of the rejections is respectfully requested.

CLAIM 16

The Examiner asserts that CRS_DV in Figs. 1, 2 and 3 shows a time-division multiplexed receive control line. However, CRS_DV described in the RMII is not a “time-division multiplexed control line” recited in claim 16 for at least the following reasons.

CRS_DV is asserted by the PHY when the receive medium is nonidle (paragraph 5.2, line 3 of the RMII; and Fig. 2), and deasserted when loss of carrier occurs (paragraph 5.2, lines 9-11 of the RMII; and Fig. 2). When the PHY has additional bits to be presented on RXD[1:0], CRS_DV toggles on nibble boundaries. Thus, in order to recover RX_DV and CRS from CRS_DV, the RMII system requires the status of RXD[1:0], upon which the meaning of CRS_DV depends (paragraph 5.2, lines 11-18).

Stated another way, the RMII system merely uses three lines (i.e., RX_DV and RXD[1:0]) to distinguish RX_DV from CRS. This is clearly not a time-division multiplexed control signal. As recited in claim 16, the time-division multiplexed control signal has a plurality of meanings on a single line. Therefore, contrary to the Examiner's assertion, Fig. 2 fails to disclose a time-division multiplexed receive control line.

Fig. 1 shows an overall architecture of the system. Fig. 1 and its corresponding description of the RMII do not contain any information about the time-division multiplexed control signal. Fig. 3 also does not teach more about the multiplexing signal than Fig. 2 does.

Accordingly, CRS_DV in Figs. 1-3 of the RMII does not teach anything about the time-division multiplexed control signal of the present invention.

The Examiner states that TX_EN in Figs. 1 and 4 shows a time-division multiplexed transmit control line. However, for at least the same reasons set forth above in connection with claim 15, Fig. 1 fails to disclose a time-division multiplexed transmit control line. Furthermore, Fig. 4 of the RMII also shows a conventional, non-multiplexed TX_EN signal. Accordingly, there is no indication that suggests time-division multiplexing in Figs. 1 and 4.

For at least these reasons, the RMII fails to disclose the time-division multiplexed receive and transmit control lines recited in claim 16. Therefore, it is respectfully submitted that the present invention of claim 16 is not anticipated by the RMII. Withdrawal of the rejections is respectfully requested.

IV. REJECTIONS OF CLAIMS 1, 4-6, AND 9-14 UNDER 35 U.S.C. §103(a)

Claims 1, 4-6, and 9-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the RMII. The rejection is respectfully traversed for at least the following reasons.

CLAIM 1

The Examiner states that CRS_DV in Fig. 2 and paragraph 6.0 of the RMII discloses sending a time-division multiplexed receive control signal. As argued in connection with claim 16, above, Fig. 2 fails to disclose the claimed time-division multiplexed receive control signal.

Also, as set forth above in connection with claim 15, paragraph 6.0 of the RMII relates to division of data bits, not control signals, and thus, paragraph 6.0 of the RMII does not disclose sending a time-division multiplexed receive control signal either.

The Examiner asserts that TX_EN in Fig. 4 and paragraph 6.0 shows sending a time-division multiplexed transmit control signal. As set forth in connection with claim 16, TX_EN in Fig. 4 fails to disclose sending a time-division multiplexed transmit control signal. Also, as stated in connection with claim 15, paragraph 6.0 of the RMII does not show sending a time-division multiplexed transmit control signal either.

Thus, as discussed above, the RMII provides an alternative interface arrangement and lacks any suggestion of an interface including time-division multiplexed control lines such as are disclosed and claimed in the present application. For at least these reasons, the RMII fails to render unpatentable the time-division multiplexed receive and transmit control lines recited in claim 1. Therefore, it is respectfully submitted that the present invention of claim 1 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIM 4

Claim 4 depends from claim 1 and therefore is believed to be allowable for at least the same reasons stated above. Furthermore, claim 4 is believed to be allowable for at least the following reasons.

Contrary to the Examiner assertion, CRS_DV in Fig. 2 and paragraph 5.2 of the RMII fails to show that a time-division multiplexed receive control signal includes 4 bit segments, and each 4 bit segment includes a receive data valid bit. Unlike the present invention, CRS_DV in Fig. 2 does not have 4 bit segments as recited in claim 4, in which each bit of a 4 bit segment has different functionality (e.g., SYNC, RX_DV, RX_ER, or CRS). Rather, CRS_DV in Fig. 2 of the RMII merely shows a CRS signal having an unspecified length of bits which occasionally functions as RX_DV depending on the status of RXD[1:0] (paragraph 5.2, lines 14-17 of the RMII) as explained in connection with claim 16. Therefore, CRS_DV in Fig. 2 does not include 4 bit segments. Nor does CRS_DV include a receive data valid bit in each 4 bit segment because there is no indication in the RMII that CRS_DV in Fig. 2 functions as RX_DV in each 4 bit segment. As explained in connection with claim 16, the RX_DV functionality of the CRS_DV is not assigned on a regular basis. The RX_DV function is activated arbitrarily based on the RXD[1:0] status (paragraph 5.2, lines 11-18).

Therefore, CRS_DV in Fig. 2 and paragraph 5.2 of the RMII do not disclose 4 bit segments, and a receive data valid bit included in each 4 bit segment, and given the alternative interface arrangement provided by RMII, no suggestion of this claimed interface is provided.

Accordingly, it is respectfully submitted that claim 4 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIM 5

Claim 5 depends from claim 1 and therefore is believed to be allowable for at least the same reasons stated above in connection with claim 1. Furthermore, claim 5 is believed to be allowable for at least the following reasons.

The Examiner states that RX_ER in Fig. 2 and paragraph 5.3.3 show that a time-division multiplexed receive control signal includes 4 bit segments, and each 4 bit segments includes a receive error bit. As set forth above in connection with claim 4, Fig. 2 fails to disclose 4 bit segments included in the time-division multiplexed receive control signal.

Paragraph 5.3.3 describes that RXD[1:0] replaces the decoded data with “01” in order to represent Receive Error Detection. In other words, contrary to the Examiner’s assertion, RX_ER is included in data lines, not a control line. Therefore, paragraph 5.3.3 does not show a receive data valid bit included in each 4 bit segments (which further included in a control signal) as recited in claim 5.

Therefore, RX_ER in Fig. 2 and paragraph 5.3.3 of the RMII do not disclose 4 bit segments, and a receive error bit included in each 4 bit segment, and given the alternative interface arrangement provided by RMII, no suggestion of this claimed interface is provided. Accordingly, it is respectfully submitted that claim 5 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIM 6

Claim 6 depends from claim 1 and therefore is believed to be allowable for at least the same reasons stated above in connection with claim 1. Furthermore, claim 6 is believed to be allowable for at least the following reasons.

As set forth above in connection with claim 4, Fig. 2 does not disclose 4 bit segments, and a carrier sense bit included in one of the 4 bit segments. Contrary to the Examiner’s assertion, paragraph 3.0, lines 12-20 of the RMII do not show any example of 4 bit segments. The portion pointed out by the Examiner merely describes that “CRS can be collapsed together with RX_DV,” and contains no description relating to “bit segments.” Further the description does not disclose any carrier sense bit included by each 4 bit segment either.

Therefore, CRS in Fig. 2 and lines 12-20 on paragraph 3.0 of the RMII do not disclose 4 bit segments, and a carrier sense bit included in each 4 bit segment, and given the alternative

interface arrangement provided by RMII, no suggestion of this claimed interface is provided. Accordingly, it is respectfully submitted that claim 6 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIM 9

Claim 9 depends from claim 1 and therefore is believed to be allowable for at least the same reasons stated above in connection with claim 1. Furthermore, claim 9 is believed to be allowable for at least the following reasons.

The Examiner states that TX_EN in Fig. 2 and paragraph 5.4 of the RMII disclose the features recited in claim 9, namely, 4 bit segments included in the time-division multiplexed transmit control signal, and a transmit enable bit included in each 4 bit segment. However, Fig. 2 does not show a transmit enable bit. Nor does paragraph 5.4 of the RMII show a transmit enable bit included in each 4 bit segment since the paragraph merely describes the existence of TX_EN.

Therefore, Fig. 2 and paragraph 5.4 of the RMII do not disclose 4 bit segments, and a transmit enable bit included in each 4 bit segment, and given the alternative interface arrangement provided by RMII, no suggestion of this claimed interface is provided. Accordingly, it is respectfully submitted that claim 9 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIM 10

Claim 10 depends from claim 1 and therefore is believed to be allowable for at least the same reasons stated above in connection with claim 1. Furthermore, claim 10 is believed to be allowable for at least the following reasons.

There is no description about 4 bit segments in paragraph 5.7. Therefore, paragraph 5.7 fails to disclose a transmit error bit included in each 4 bit segment, and given the alternative interface arrangement provided by RMII, no suggestion of this claimed interface is provided. Accordingly, it is respectfully submitted that claim 10 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIM 11

Claim 11 depends from claim 1 and therefore is believed to be allowable for at least the same reasons stated above in connection with claim 1. Furthermore, claim 11 is believed to be allowable for at least the following reasons.

There is no description about indicating the speed of the PHY using the receive data line in paragraph 3.0, lines 17-22. Therefore, paragraph 3.0 fails to teach or suggest the feature recited in claim 11. Accordingly, it is respectfully submitted that claim 11 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIM 12

Claim 12 depends from claim 1 and therefore is believed to be allowable for at least the same reasons stated above in connection with claim 1. Furthermore, claim 12 is believed to be allowable for at least the following reasons.

Similar to the reasons set forth in connection with claim 11, there is no description about indicating the speed of the PHY using the receive data line in paragraph 3.0, lines 17-22. Therefore, paragraph 3.0 fails to teach or suggest the feature recited in claim 12. Accordingly, it is respectfully submitted that claim 12 is patentable over the RMII. Withdrawal of the rejection is respectfully requested.

CLAIMS 13 AND 14

Claims 13 and 14 depend from claim 1, and therefore are believed to be allowable for at least the same reasons stated above in connection with claim 1.

V. REJECTIONS OF CLAIMS 2, 3, 7, AND 8 UNDER 35 U.S.C. §103(a)

Claims 2, 3, 7, and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the RMII in view of Albrow et al. (U.S. Patent No. 5,987,023). The rejection is respectfully traversed for at least the following reasons.

Claims 2, 3, 7, and 8 depend from claim 1 either directly or indirectly. Thus, these claims are believed to be allowable for at least the same reasons set forth above in connection with claim 1. Furthermore, claims 2, 3, 7, and 8 are believed to be allowable for at least the following reasons.

The Examiner asserts that Fig. 2 and paragraphs 5.2-5.5 disclose a time-division multiplexed control signal including 4 bit segments, and a synchronization bit included in each 4 bit segment. However, the Examiner's assertion is not correct for the reasons set forth above in connection with claims 15 and 16. Albrow et al. does not disclose 4 bit segments included in a time-division multiplexed control signal as recited in claims 2, 3, 7, and 8 either. Thus, Albrow et al. fails to make up the deficiency of the RMII in this regard.

Moreover, those skilled in the art would not combine Albrow et al. with the RMII for the following reasons. Albrow et al. relates to radio links for a wireless communication system (for

example, column 3, lines 11-14). Therefore, unlike the present invention, the Albrow et al.'s system does not utilize receive and transmit control lines.

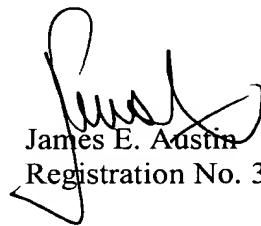
The Examiner states that Fig. 5(b) of Albrow et al. shows the synchronization bit recited in claims 2, 3, 7, and 8. However, Fig. 5(b) shows "uplink normal physical packet" which is sent through a radio link (for example, column 3, lines 14-26; and Fig. 2). In other words, the timing chart shown in Fig. 5(b) of Albrow et al. represents data timing for a radio link using "air interface" as clearly indicated in Fig. 1. The synchronous bits b0-b23 in Fig. 5(b) of Albrow et al. are one part of a data packet sent by a radio link, not a control line. Furthermore, there is no motivation or incentive to combine the teaching of synchronization bits for a radio link with the teaching of time-division multiplexed control lines. Therefore, those skilled in the art would not combine the RMII and Albrow et al.

For at least the above reasons, it is respectfully submit that claims 2, 3, 7, and 8 are patentable over the RMII Specification in view of Albrow et al.

VI. CONCLUSION

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



James E. Austin
Registration No. 39,489

P.O. Box 778
Berkeley, CA 94704-0778
Tel: (510) 843-6200